AT&T
BELL LABORATORIES

Volume 63
1984

# TECHNICAL JOURNAL

A JOURNAL OF THE AT&T COMPANIES

**EDITORIAL COMMITTEE**

A. A. PENZIAS, *Editorial Committee Chairman,*
*AT&T Bell Laboratories*

M. M. BUCHNER, JR., *AT&T Bell Laboratories*
R. P. CLAGETT, *AT&T Technologies*
R. P. CREAN, *AT&T Technologies*
B. R. DARNALL, *AT&T Bell Laboratories*
B. P. DONOHUE III, *AT&T Information Systems*
R. C. FLETCHER, *AT&T Bell Laboratories*
D. HIRSCH, *AT&T Consumer Products*
S. HORING, *AT&T Bell Laboratories*
R. A. KELLEY, *AT&T Bell Laboratories*
J. F. MARTIN, *AT&T Technologies*
J. S. NOWAK, *AT&T Bell Laboratories*
B. B. OLIVER, *AT&T Communications*
J. W. TIMKO, *AT&T Information Systems*
V. A. VYSSOTSKY, *AT&T Bell Laboratories*

**EDITORIAL STAFF**

B. G. KING, *Editor*
M. D. McILROY, *Technical Editor, Computing Science and Systems*
P. WHEELER, *Managing Editor*
L. S. GOLLER, *Assistant Editor*
A. M. SHARTS, *Assistant Editor*
B. G. GRUBER, *Circulation*

**Index and Contents**

AMERICAN TELEPHONE AND TELEGRAPH COMPANY
NEW YORK

## LIST OF ISSUES IN VOLUME 63


| | Pages |
|---|---|
| No. 1, January | 1–206 |
| No. 2, February | 207–378 |
| No. 3, March | 379–530 |
| No. 4, April | 531–688 |
| No. 5, May–June | 689–856 |
| No. 6, July–August | 857–1212 |
| No. 7, September | 1213–1418 |
| No. 8, October | 1419–1910 |
| No. 9, November | 1911–2134 |
| No. 10, December | 2135–2442 |

Index ..... 3
Contents ..... 21

# Index to Volume 63

## A


Abbreviations and acronyms, *SLC®* 96 subscriber loop carrier system, **63** (1984) 2439–2441

Abele, T. A., **63** (1984) 2273–2281

Absorption, overtone, and Raman spectra of $H_2$ and $D_2$ in silica optical fibers, **63** (1984) 991–1000

*Accuracy of Forecasting Telephone Usage Demand, On the,* **63** (1984) 819–849

Ackroyd, M. H., **63** (1984) 2159–2170

Acronyms and abbreviations, *SLC®* 96 subscriber loop carrier system, **63** (1984) 2439–2441

Adaptive differential pulse code modulation *See* ADPCM

Adaptive postfiltering, enhancement of ADPCM speech by, **63** (1984) 1465–1475

*Adaptive Transversal Equalization of Multipath Propagation for 16-QAM 90-Mb/s Digital Radio,* **63** (1984) 1447–1463

ADPCM speech enhancement by adaptive postfiltering, **63** (1984) 1465–1475

Aho, A. V., **63** (1984) 1573–1576

Airlines reservation and information system medium-size vocabulary, hidden Markov models used for recognition of isolated words from, **63** (1984) 627–642

Akaike state space technique for forecasting telephone usage demand, accuracy of, **63** (1984) 819–849

Akinpelu, M., **63** (1984) 1261–1281

Algorithm, constructive, and nonlinear zero-one combinatorial, goal-programming model for solving multiobjective assignment problems, **63** (1984) 665–677

Algorithm, improved word-detection, for telephone-quality speech incorporating both syntactic and semantic constraints, **63** (1984) 479–498

Ali, S. S., **63** (1984) 441–457

Amitay, N., **63** (1984) 2215–2259

Analog and digital transmission facilities interconnection using LT-1 connector, **63** (1984) 879–900

Analog voice and voiceband data transmission performance characterization of the public switched network, 1982/83 end office connection study, **63** (1984) 2059–2119

Analysis, distortion, on measuring the impulse response of a system using a crosscorrelation method, **63** (1984) 2171–2192

*Analysis of a Demand Assignment TDMA Blocking System,* **63** (1984) 89–114

*Analysis of a TDMA Network With Voice and Data Traffic,* **63** (1984) 1537–1563

Analysis, probabilistic, of interframe tie requirements for cross-connect systems, **63** (1984) 643–664

Anderson, W. T., **63** (1984) 425–430

Antenna, pyramidal horn-reflector, experimental investigation of wide-angle sidelobe suppression in, **63** (1984) 531–544

Antenna sidelobe energy suppression, **63** (1984) 531–544

Antireflection coatings, single-layer, on laser facets, theoretical design of, **63** (1984) 357–364

*Application of Embedded Training to Connected Letter Recognition for Directory Listing Retrieval, On the,* **63** (1984) 459–477

*Application of Energy Contours to the Recognition of Connected Word Sequences, On the,* **63** (1984) 1981–1995

*Approximate Analysis of Sojourn Times in the M/G/1 Queue With Round-Robin Service Discipline, An,* **63** (1984) 1521–1535

*Approximations for Queues, On*

*I: Extremal Distributions,* **63** (1984) 115–138

*II: Shape Constraints,* **63** (1984) 139–161

*III: Mixtures of Exponential Distributions,* **63** (1984) 163–175

Approximations, heavy-traffic, for service systems with blocking, **63** (1984) 689–708
Arbitrary routing policy, blocking probability in a switching center with, **63** (1984) 709–720
ASPEN data acquisition system and sampling plan, 1982/83 end office connection study, **63** (1984) 2033–2057
Assignment problems, multiobjective, nonlinear zero-one combinatorial, goal-programming model and constructive algorithm for solving, **63** (1984) 665–677
Astronomical measurements of radio brightness, **63** (1984) 1997–2031
AT&T Technologies hardware, multiprocessor *UNIX*™ systems used on, **63** (1984) 1733–1749
*AT&T Technologies Implementation of Local Area Data Transport—A Hardware and Software Overview*, **63** (1984) 1135–1190
AT&T 3B20S and 3B5 minicomputers, porting the *UNIX*™ operating system to, **63** (1984) 1769–1790
Attenuation, 800-MHz, measured in and around suburban houses, **63** (1984) 921–954
Automated directory listings retrieval, **63** (1984) 459–477
Automatic speech-recognition systems error-rate behavior, **63** (1984) 1–32
Automatic system for performance evaluation of the network *See* ASPEN
Autoregressive spectrum estimation for forecasting telephone usage demand, accuracy of, **63** (1984) 819–849

## B

Bach, M. J., **63** (1984) 1733–1749
Bainbridge, G. D., **63** (1984) 2333–2362
Barta, S. M., **63** (1984) 89–114
Base station diversity, BER degradations caused by switching in digital mobile radio systems using, **63** (1984) 545–564
Batorsky, D. V., **63** (1984) 775–818
Bell System noise survey of the loop plant, 1980, **63** (1984) 775–818
Benvenuto, N., **63** (1984) 2171–2192
*BER Degradations Caused by Switching in Digital Mobile Radio Systems Using Base Station Diversity*, **63** (1984) 545–564
Binary signaling, faster, with QAM contrasting performance of, **63** (1984) 1419–1445
Bit error rate *See* BER
Bit-rate coding for gray-level pictures, **63** (1984) 249–260
Bleisch, G. W., **63** (1984) 879–900
Blit, a multiplexed graphics terminal designed for the *UNIX*™ system, **63** (1984) 1607–1631
Blit terminal, debugging *UNIX*™ C programs with, **63** (1984) 1633–1647
*Blocking Probability in a Switching Center With Arbitrary Routing Policy*, **63** (1984) 709–720
Blocking, service systems with, heavy-traffic approximations for, **63** (1984) 689–708
Blocking system, demand assignment TDMA, analysis of, **63** (1984) 89–114
Bodenstab, D. E., **63** (1984) 1769–1790
Bohn, P. P., **63** (1984) 2389–2416
Box-Jenkins technique for forecasting telephone usage demand, accuracy of, **63** (1984) 819–849
Brackett, C. A., **63** (1984) 2389–2416
Broadband matching of a corrugated feed, quarter-wave corrugated transformer for, **63** (1984) 207–215
Brown, M. K., **63** (1984) 441–457
Bubble memory device with 16-$\mu m^2$ cell, experimental ion-implanted, **63** (1984) 337–355
Buckler, M. J., **63** (1984) 2389–2416
Budrikis, Z. L., **63** (1984) 217–229, 1499–1520
Buffer behaviour, stationary and cyclostationary finite, computation via Levinson's method, **63** (1984) 2159–2170
*Build—A Software Construction Tool*, **63** (1984) 1049–1059
Burke, M. E., **63** (1984) 775–818
Buroff, S. J., **63** (1984) 1733–1749
Burrus, C. A., **63** (1984) 991–1000
Butler, T. W., **63** (1984) 1007–1018

## C

Cable reel assignment from inventoried stock, technique for, **63** (1984) 665–677
Calculation of the reflection coefficient for coated optical waveguide devices, exact, **63** (1984) 857–877
Calculations and measurements, comparisons for wideband operation of nonlinear solid-state power amplifiers, **63** (1984) 231–248

Call and time congestion, approximations for, **63** (1984) 689–708
Call blocking, **63** (1984) 709–720
*Capacity of Sticky Storage Devices, On the,* **63** (1984) 1311–1323
Carey, M. B., **63** (1984) 2059–2119
Cargill, T. A., **63** (1984) 1633–1647
Carrier sense multiple access/collision detection *See* CSMA/CD
Carrier system, fiber SLC, subscriber loop carrier system *SLC*® 96, **63** (1984) 2389–2416
Channel bank, *SLC*® subscriber loop carrier system, **63** (1984) 2283–2331
Channel-bank spectrometer data processing, **63** (1984) 565–585
Cheap dynamic instruction counting, implementation in *UNIX*™ system, **63** (1984) 1815–1826
Chen, H.-T., **63** (1984) 2059–2119
Chip packages, computing inductive noise of, **63** (1984) 177–195
Chow, M. C., **63** (1984) 737–773
Chraplyvy, A. R., **63** (1984) 991–1000
Circuit/packet switch, **63** (1984) 1499–1520
Circuits design, network services, generic approaches to, **63** (1984) 737–773
*Click Modulation,* **63** (1984) 401–423
Clipped signals
  Fourier transform theory of recovery for, **63** (1984) 287–306
  generalizations, **63** (1984) 379–399
  localization of infinite products, **63** (1984) 261–285
Closed and open models for networks of queues, **63** (1984) 1911–1979
Coated optical waveguide devices, exact calculation of reflection coefficient for, **63** (1984) 857–877
Coded speech evaluation using Itakura-Saito measures, **63** (1984) 1477–1498
Coding, conditional variable-length, for gray-level pictures, **63** (1984) 249–260
*Coding for a Write-Once Memory,* **63** (1984) 1089–1112
Coefficient, reflection, for coated optical waveguide devices, exact calculation of, **63** (1984) 857–877
Combinatorial goal-programming model, nonlinear zero-one, and constructive algorithm for solving multiobjective assignment problems, **63** (1984) 665–677
Comments on *Off-Line Quality Control in Integrated Circuit Fabrication Using Experimental Design, by M. S. Phadke, R. N. Kackar, D. V. Speeney, and M. J. Grieco,* **63** (1984) 1405–1408; reply **63** (1984) 1408–1409
Communication systems, applications of solitons to, **63** (1984) 901–919
Communication system to maximize uncertainty of unauthorized intruder, wiretap channel II, **63** (1984) 2135–2157
Companded PCM over Gaussian and Rayleigh fading channels, transmission errors in, **63** (1984) 955–990
Companded PCM transmitted over Rayleigh fading and Gaussian channels, weighting strategies for, **63** (1984) 587–626
Comparison of voice transmission on CSMA/CD networks and on token buses, simulation-based, **63** (1984) 33–55
Computation of stationary and cyclostationary finite buffer behaviour via Levinson's method, **63** (1984) 2159–2170
Computer network running the *UNIX*™ system, **63** (1984) 1877–1896
Computer programs for traffic-related problems, **63** (1984) 1283–1310
*Computer Response Time and User Performance During Data Entry,* **63** (1984) 1007–1018
Computing capacity of cross-connect system, **63** (1984) 643–664
*Computing Inductive Noise of Chip Packages,* **63** (1984) 177–195
Computing science and systems, **63** (1984) 1007–1212, 1571–1910
*Conditional Variable-length Coding for Gray-Level Pictures,* **63** (1984) 249–260
Connected letter recognition for directory listing retieval, application of embedded training to, **63** (1984) 459–477
Connected word recognition, application of energy contours to, **63** (1984) 1981–1995
Connected word sequences, application of energy contours to recognition of, **63** (1984) 1981–1995
Connection study, 1982/83 end office
  analog voice and voiceband data transmission performance characterization of the public switched network, **63** (1984) 2059–2119
  ASPEN data acquisition and sampling plan, **63** (1984) 2033–2057
Connector family of transmultiplexers, LT-1, **63** (1984) 879–900
Construction of a working sort routine in

the *UNIX*™ system, theory and practice in, **63** (1984) 1827–1843
Construction tool for software, build, **63** (1984) 1049–1059
Constructive algorithm and nonlinear zero-one combinatorial, goal-programming model for solving multiobjective assignment problems, **63** (1984) 665–677
Containment constraints, optimum scan-width selection under, **63** (1984) 1191–1212
*Contrasting Performance of Faster Binary Signaling With QAM*, **63** (1984) 1419–1445
C programming language
  data abstraction in, **63** (1984) 1701–1732
  past and future, in the *UNIX*™ system, **63** (1984) 1685–1699
C programs, *UNIX*™, debugging with the Blit, **63** (1984) 1633–1647
Corrugated feed, quarter-wave corrugated transformer for broadband matching of, **63** (1984) 207–215
Corrugated waveguide transformation, **63** (1984) 207–215
Counting in the *UNIX*™ system, cheap dynamic instruction, **63** (1984) 1815–1826
Count profiling in *UNIX*™ system, **63** (1984) 1815–1826
Couplers, single GRIN-lens directional, **63** (1984) 431–439
Cox, D. C., **63** (1984) 921–954
Cross-connect systems, probabilistic analysis of interframe tie requirements for, **63** (1984) 643–664
Crosscorrelation method, distortion analysis on measuring the impulse response of a system using, **63** (1984) 2171–2192
Cross-polarized M-ary QAM signals over nondispersive fading channels, performance of, **63** (1984) 499–521
Crypt command, *UNIX*™ system, and file security, **63** (1984) 1673–1683
CSMA/CD networks and token buses, simulation-based comparison of voice transmission on, **63** (1984) 33–55
Cyclostationary and stationary finite buffer behaviour computation via Levinson's method, **63** (1984) 2159–2170

## D

Data abstraction in *UNIX*™ system C programming language, **63** (1984) 1701–1732
Data access in a local distributed environment, program transformations for, **63** (1984) 1019–1028
Data acquisition system, ASPEN, and sampling plan, 1982/83 end office connection study, **63** (1984) 2033–2057
Data and voice services on Fasnet, integrated, **63** (1984) 307–336
Data and voice traffic, analysis of a TDMA network with, **63** (1984) 1537–1563
Data communication services, performance of faster binary signaling with QAM for, **63** (1984) 1419–1445
Data communications protocols, link-level, implementation using *UNIX*™ operating system virtual protocol machine, **63** (1984) 1859–1876
Data entry, computer response time and user performance during, **63** (1984) 1007–1018
Data traffic types, queueing and framing disciplines for a mixture of, **63** (1984) 1061–1087
Data transmission, digital, over dually polarized radio fading channels, linear equalization theory in, **63** (1984) 2215–2259
Data transmission performance characterization of the public switched network, analog voice and voiceband, 1982/83 end office connection study, **63** (1984) 2059–2119
Data transport service, local area
  overview, **63** (1984) 1113–1134
  overview of hardware and software for, **63** (1984) 1135–1190
DCLU *See* Digital carrier line unit
Debugging *UNIX*™ C programs with the Blit, **63** (1984) 1633–1647
Decision demodulation, soft, to reduce the effect of transmission errors in logarithmic PCM transmitted over Rayleigh fading channels, **63** (1984) 2193–2213
Decryption method for *UNIX*™ system crypt command, **63** (1984) 1673–1683
Degradation, BER, caused by switching in digital mobile radio systems using base station diversity, **63** (1984) 545–564
Deimel, P. P., **63** (1984) 857–877
Demand assignment TDMA blocking system, analysis of, **63** (1984) 89–114
Depressed cladding single-mode fibers, design diagrams for, **63** (1984) 425–430
Descloux, A., **63** (1984) 2059–2119
*Design Diagrams for Depressed Cladding*

*Single-Mode Fibers*, **63** (1984) 425–430
Design of network services circuits, generic approaches to the, **63** (1984) 737–773
Design of single-layer antireflection coatings on laser facets, theoretical, **63** (1984) 357–364
DeTreville, J. D., **63** (1984) 33–55, 1019–1028
Diagrams for depressed cladding single-mode fibers, design, **63** (1984) 425–430
Digital and analog transmission facilities interconnection using LT-1 connector, **63** (1984) 879–900
Digital carrier line unit, *5ESS*™ switching system peripheral unit for *SLC*® 96 subscriber loop carrier system, **63** (1984) 2417–2437
Digital data transmission over dually polarized fading radio channels, linear equalization theory in, **63** (1984) 2215–2259
Digital filters, moment calculations by, **63** (1984) 217–229
Digital mobile radio systems using base station diversity, BER degradations caused by switching in, **63** (1984) 545–564
Digital noise power in $\mu$-law PCM radio transmission systems examined for Gaussian and Rayleigh fading channels, **63** (1984) 955–990
Digital radio, adaptive transversal equalization of multipath propagation for 16-QAM, 90-Mb/s, **63** (1984) 1447–1463
Digital subscriber loop carrier system *SLC*® 96
  acronyms and abbreviations, **63** (1984) 2439–2441
  channel bank, **63** (1984) 2283–2331
  fiber *SLC*® carrier system, **63** (1984) 2389–2416
  integration with the *5ESS*™ switching system, **63** (1984) 2417–2437
  maintenance and operation, **63** (1984) 2363–2387
  overview, **63** (1984) 2273–2281
  physical design, **63** (1984) 2333–2362
Digitized speech transmission over a local-area network, **63** (1984) 33–55
Directional couplers, single GRIN-lens, **63** (1984) 431–439
Directory listing retrieval, application of embedded training to connected letter recognition for, **63** (1984) 459–477
Disciplines for a mixture of data traffic types, queueing and framing, **63** (1984) 1061–1087
*Distortion Analysis on Measuring the Impulse Response of a System Using a Crosscorrelation Method*, **63** (1984) 2171–2192
Distributed environment, local, program transformations for data access in, **63** (1984) 1019–1028
Dodds, S., **63** (1984) 879–900
Dragone, C., **63** (1984) 207–215
$D_2$ and $H_2$ in silica optical fibers, overtone absorption and Raman spectra of, **63** (1984) 991–1000
*DTWP: An LPC-Based Dynamic Time-Warping Processor for Isolated Word Recognition, The*, **63** (1984) 441–457
Dually polarized fading radio channels, linear equalization theory in digital data transmission over, **63** (1984) 2215–2259
Dual-polarized M-ary QAM signals over nondispersive radio channels, performance of, **63** (1984) 499–521
Dynamic time warping and hidden Markov model for speech recognition; a unified view, **63** (1984) 1213–1243
Dynamic time-warping processor (DTWP) for isolated word recognition, LPC-based, **63** (1984) 441–457

## E

Economical local area data transport service, **63** (1984) 1113–1134, 1135–1190
Effect of transmission errors in logarithmic PCM transmitted over Rayleigh fading channels, soft decision demodulation to reduce, **63** (1984) 2193–2213
*800-MHz Attenuation Measured In and Around Suburban Houses*, **63** (1984) 921–954
Eisenstein, G., **63** (1984) 357–364
*Electrical Transmission Lines as Models for Soliton Propagation in Materials: Elementary Aspects of Video Solitons*, **63** (1984) 901–919
Elementary aspects of video solitons; electrical transmission lines as models for soliton propagation in materials, **63** (1984) 901–919
Embedded training to connected letter recognition for directory listing retrieval, application of, **63** (1984) 459–477
Encryption in file security, **63** (1984) 1673–1683

End office connection study, 1982/83
analog voice and voiceband data transmission performance characterization of the public switched network, **63** (1984) 2059–2119
ASPEN data acquisition system and sampling plan, **63** (1984) 2033–2057
Endpoint detection of spoken words, **63** (1984) 479–498
Energy and LPC parameters combined in a vector quantizer and its application to isolated word recognition, **63** (1984) 721–735
Energy contours, application to the recognition of connected word sequences, **63** (1984) 1981–1995
Engineered networks with nonhierarchical and hierarchical routing, overload performance of, **63** (1984) 1261–1281
*Enhancement of ADPCM Speech by Adaptive Postfiltering*, **63** (1984) 1465–1475
EOCS *See* End office connection study
Equalization, adaptive transversal, of multipath propagation for 16-QAM, 90-Mb/s digital radio, **63** (1984) 1447–1463
Equalization theory, linear, in digital data transmission over dually polarized fading radio channels, **63** (1984) 2215–2259
Erickson, V. B., **63** (1984) 1049–1059
Erratum to AT&T Bell Lab. Tech. J. **63** (1984) 1061–1087, 1416
Error-rate behavior of isolated-word-speech-recognition systems, **63** (1984) 1–32
Errors, transmission, in companded PCM over Gaussian and Rayleigh fading channels, **63** (1984) 955–990
Errors, transmission, in logarithmic PCM transmitted over Rayleigh fading channels, soft decision demodulation to reduce the effect of, **63** (1984) 2193–2213
Evaluation of speech coder performance using the Itakura-Saito measures, **63** (1984) 1477–1498
Evolution of C programming language, past and future, in the *UNIX*™ system, **63** (1984) 1685–1699
Evolution of *UNIX*™ system performance, **63** (1984) 1791–1814
Evolution of *UNIX*™ time-sharing system, **63** (1984) 1577–1593
*Exact Calculation of the Reflection Coefficient for Coated Optical Waveguide Devices*, **63** (1984) 857–877
*Experimental Investigation of Wide-Angle Sidelobe Suppression in a Pyramidal Horn-Reflector Antenna, An*, **63** (1984) 531–544
*Experimental Ion-Implanted Bubble Memory Device With 16-$\mu m^2$ Cell*, **63** (1984) 337–355
Exponential distribution mixtures, approximations for queues, **63** (1984) 163–175
Extremal distributions, approximations for queues, **63** (1984) 115–138

## F

Fabrication of integrated circuits, optimization algorithms for, **63** (1984) 1191–1212
Fading channels
Gaussian and Rayleigh, transmission errors in companded PCM over, **63** (1984) 955–990
nondispersive, performance of cross-polarized M-ary QAM signals over, **63** (1984) 499–521
Rayleigh, soft decision demodulation to reduce the effect of transmission errors in logarithmic PCM transmitted over, **63** (1984) 2193–2213
Fading radio channels, dually polarized, linear equalization theory in digital data transmission over, **63** (1984) 2215–2259
Fair share scheduler in the *UNIX*™ operating system, **63** (1984) 1845–1857
Fasnet, integrated voice and data services on, **63** (1984) 307–336
Faster binary signaling with QAM, contrasting performance of, **63** (1984) 1419–1445
FBS *See* Faster binary signaling
Feder, J., **63** (1984) 1791–1814
Felton, W. A., **63** (1984) 1751–1767
Fenderson, G. L., **63** (1984) 1447–1463
Fiber optics, **63** (1984) 425–430
Fiber *SLC*® carrier system, *SLC* 96 subscriber loop carrier system, **63** (1984) 2389–2416
Fibers
depressed cladding single-mode, design diagrams for, **63** (1984) 425–430
high-birefringence single-mode, polarization quality of, **63** (1984) 365–371
silica optical, overtone absorption and Raman spectra of $H_2$ and $D_2$ in, **63** (1984) 991–1000
File security and the *UNIX*™ system crypt

command, **63** (1984) 1673–1683
Filtering, spatial, radio astronomical data, one-dimensional case, **63** (1984) 1997–2031
Filters, digital, moment calculations by, **63** (1984) 217–229
Finite buffer behaviour computation via Levinson's method, stationary and cyclostationary, **63** (1984) 2159–2170
Fitton, M. J., **63** (1984) 1859–1876
*5ESS*™ switching system integrated with *SLC*® 96 subscriber loop carrier system, **63** (1984) 2417–2437
Fleming, P. J., **63** (1984) 1521–1535
Fletcher, J. H., **63** (1984) 665–677
Forecasting telephone usage demand, accuracy of, **63** (1984) 819–849
Forecasting, trunk, **63** (1984) 57–88
Foreword, the *UNIX*™ system, **63** (1984) 1573–1576
Foschini, G. J., **63** (1984) 1419–1445
Fourier transform theory of recovery for clipped signals, **63** (1984) 287–306
Framing and queueing disciplines for a mixture of data traffic types, **63** (1984) 1061–1087
Fraser, A. G., **63** (1984) 1061–1087
Fritz, T. E., **63** (1984) 1877–1896
FSS *See* Fair share scheduler

## G

Garcia, J.-M., **63** (1984) 709–720
Garey, M. R., **63** (1984) 1191–1212
Gaussian and Rayleigh fading channels, transmission errors in companded PCM over, **63** (1984) 955–990
Gaussian channels and Rayleigh fading weighting strategies for companded PCM transmitted over, **63** (1984) 587–626
*Generic Approaches to the Design of Network Services Circuits*, **63** (1984) 737–773
Gharavi, H., **63** (1984) 249–260
GI/M/1 queue
  extremal distributions for, **63** (1984) 115–138
  mixtures of exponential distributions for, **63** (1984) 163–175
  shape constraints for, **63** (1984) 139–161
Glance, B. S., **63** (1984) 545–564
Glodis, P. F., **63** (1984) 425–430
Goal-programming model, nonlinear zero-one combinatorial, and constructive algorithm for solving multiobjective assignment problems, **63** (1984) 665–677
Gopinath, B., **63** (1984) 709–720
Gradient index *See* GRIN
Grampp, F. T., **63** (1984) 1649–1672
Granlund, S. W., **63** (1984) 431–439
Graphics terminal, multiplexed, designed for the *UNIX*™ system, Blit, **63** (1984) 1607–1631
Gray-level pictures, conditional variable-length coding for, **63** (1984) 249–260
Grieco, M. J., **63** (1984) 1408–1409
GRIN-lens directional couplers, single, **63** (1984) 431–439

## H

Hardware and software overview of AT&T Technologies implementation of local area data transport, **63** (1984) 1135–1190
Harkness, C. J., **63** (1984) 1859–1876
Hatamian, M., **63** (1984) 217–229
Healy, J. D., **63** (1984) 2033–2057
*Heavy-Traffic Approximations for Service Systems With Blocking*, **63** (1984) 689–708
Hefner, J. E., **63** (1984) 1877–1896
Henn, R. W., **63** (1984) 2333–2362
Henry, G. J., **63** (1984) 1845–1857
*Hidden Markov Model and Dynamic Time Warping for Speech Recognition—A Unified View, On the*, **63** (1984) 1213–1243
Hidden Markov models used for speaker-independent recognition of isolated words from a medium-size vocabulary, **63** (1984) 627–642
Hierarchical and nonhierarchical routing, overload performance of engineered networks with, **63** (1984) 1261–1281
Hierarchical networks, trunk implementation plan for, **63** (1984) 57–88
High-birefringence single-mode fibers, polarization quality of, **63** (1984) 365–371
High-performance, moderate-computation, isolated word recognizer using vector quantization and temporal energy contours, **63** (1984) 1245–1260
High-speed local area network, interconnection of *UNIX*™ operating systems over, **63** (1984) 1877–1896
Homes and small businesses, data transmission services provided by LADT to, **63** (1984) 1113–1134
Honig, M. L., **63** (1984) 89–114, 1537–1563
Horn-reflector antenna, pyramidal, experimental investigation of wide-angle sidelobe suppression in, **63** (1984) 531–544

Houghton, T. F., **63** (1984) 1769–1790
$H_2$ and $D_2$ in silica optical fibers, overtone absorption and Raman spectra of, **63** (1984) 991–1000

## I

IBM hardware, multiprocessor *UNIX*™ systems used on, **63** (1984) 1733–1749
IBM System/370 computers, implementation of *UNIX*™ operating system for, **63** (1984) 1751–1767
Implementation by AT&T Technologies of local area data transport, hardware and software overview, **63** (1984) 1135–1190
Implementation plan, trunk, for hierarchical networks, **63** (1984) 57–88
*Improved Word-Detection Algorithm for Telephone-Quality Speech Incorporating Both Syntactic and Semantic Constraints, An,* **63** (1984) 479–498
Impulse response of a system using a cross-correlation method, distortion analysis on measuring, **63** (1984) 2171–2192
Induced noise voltages and currents as subscriber and central office loop interfaces, 1980 Bell System noise survey findings, **63** (1984) 775–818
Inductive noise of chip packages, computing, **63** (1984) 177–195
Ingle, J. F., **63** (1984) 2059–2119
Injection lasers, semiconductor, use of single-layer antireflection coating films in, **63** (1984) 357–364
Input-output system, stream, for *UNIX*™, **63** (1984) 1897–1910
Instruction counting, cheap dynamic, implementation in *UNIX*™ system, **63** (1984) 1815–1826
Integrated circuit fabrication, **63** (1984) 1191–1212
Integrated local communications network, packet/circuit switch suitable for, **63** (1984) 1499–1520
Integrated voice-data network with demand assignment TDMA, analysis of, **63** (1984) 1537–1563
*Integrated Voice/Data Services on Fasnet,* **63** (1984) 307–336
Integration with the *5ESS*™ switching system, *SLC*® 96 subscriber loop carrier system, **63** (1984) 2417–2437
Intel* 8086-based system, porting the *UNIX*™ operating system to, **63** (1984) 1767–1790
Interconnection of digital and analog transmission facilities using LT-1 connector, **63** (1984) 879–900
Interframe tie requirements for cross-connect systems, probabilistic analysis of, **63** (1984) 643–664
Intruder, unauthorized, communication system to maximize uncertainty of, wiretap channel II, **63** (1984) 2135–2157
Inventors of the *UNIX*™ system, K. Thompson and D. M. Ritchie, **63** (1984) 1571–1572, 1573–1576
Ion-implanted bubble memory device with 16-$\mu m^2$ cell, experimental, **63** (1984) 337–355
Isolated word recognition
  LPC-based dynamic time-warping processor (DTWP) for, **63** (1984) 441–457
  vector quantizer combining energy and LPC parameters and its application to, **63** (1984) 721–735
Isolated words from a medium-size vocabulary, use of hidden Markov models for speaker-independent recognition of, **63** (1984) 627–642
Isolated-word speech-recognition systems error-rate behavior, **63** (1984) 1–32
Isolated word speech recognizers using vector quantization and temporal energy contours, performance of, **63** (1984) 1245–1260
*Itakura-Saito Measures for Speech Coder Performance Evaluation, On Using the,* **63** (1984) 1477–1498

## J

Jagerman, D. L., **63** (1984) 1283–1310
Jayant, N. S., **63** (1984) 1465–1475
Juang, B.-H., **63** (1984) 1213–1243, 1477–1498
Jugle, D. B., **63** (1984) 1405–1408

## K

Kackar, R. N., **63** (1984) 1408–1409
Kafka, H. J., **63** (1984) 1135–1190
Kaplan, D. R., **63** (1984) 857–877
Kashper, A. N., **63** (1984) 57–88
Kavehrad, M., **63** (1984) 499–521
Kelleman, K. A., **63** (1984) 1769–1790, 1859–1876
Kernighan, B. W., **63** (1984) 1595–1605
Klincewicz, J. G., **63** (1984) 139–161
Körner, J., **63** (1984) 1089–1112

* Trademark of Intel Corporation.

## L

LADT *See* Local area data transport
Lampell, M., **63** (1984) 2033–2057
LAN *See* Local-area network; *see also specific* LAN, Fasnet
Laser facets, theoretical design of single-layer antireflection coatings on, **63** (1984) 357–364
LATA *See* Local access and transport area
Leeper, D. G., **63** (1984) 2033–2057
Legg, W. E., **63** (1984) 207–215
Letter to the Editor, **63** (1984) 1405–1408
Levinson, F. H., **63** (1984) 431–439
Levinson, S. E., **63** (1984) 627–642, 721–735
Levinson's method used for stationary and cyclostationary finite buffer behavior computation, **63** (1984) 2159–2170
Lightwave systems in *SLC*® 96 subscriber loop carrier system, **63** (1984) 2389–2416
Limb, J. O., **63** (1984) 307–336
Linderman, J. P., **63** (1984) 1827–1843
*Linear Equalization Theory in Digital Data Transmission Over Dually Polarized Fading Radio Channels*, **63** (1984) 2215–2259
Linear predictive coding *See* LPC
Link-level data communications protocols, implementation using *UNIX*™ operating system virtual protocol machine, **63** (1984) 1859–1876
Lipske, K. R., **63** (1984) 665–677
Local access and transport area, data transport service provided by LADT to, **63** (1984) 1113–1134, 1135–1190
Local area data transport, AT&T Technologies implementation of, hardware and software overview, **63** (1984) 1135–1190
*Local Area Data Transport Service Overview*, **63** (1984) 1113–1134
Local-area networks, digitized speech transmission over, **63** (1984) 33–55
Local distributed environment, program transformations for data access in, **63** (1984) 1019–1028
Localization of infinite products of clipped signals, **63** (1984) 261–285
Local packet switching network, LADT
  overview, **63** (1984) 1113–1134
  overview of hardware and software for, **63** (1984) 1135–1190
Logan, B. F., Jr., **63** (1984) 261–285, 287–306, 379–399, 401–423
Logarithmic PCM transmitted over Rayleigh fading channels, soft decision demodulation to reduce the effect of transmission errors in, **63** (1984) 2193–2213
Long, P. F., **63** (1984) 1859–1876
Long-haul toll network, use of LT-1 connector in, **63** (1984) 879–900
Loop plant, 1980 Bell System noise survey of the, **63** (1984) 775–818
LPC-based dynamic time-warping processor (DTWP) for isolated word recognition, **63** (1984) 441–457
LPC parameters and energy combined in a vector quantizer and its application to isolated word recognition, **63** (1984) 721–735
*LT-1 Connector Family of Transmultiplexers, The*, **63** (1984) 879–900
Luniewicz, M. M., **63** (1984) 2283–2331

## M

Magnetic bubble material and test-circuit design, **63** (1984) 337–355
Mainframes, large, *UNIX*™ system performance on, **63** (1984) 1751–1767
Maintenance and operation, *SLC*® 96 subscriber loop carrier system, **63** (1984) 2363–2387
Malek-Zavarei, M., **63** (1984) 737–773
Mark, J. W., **63** (1984) 307–336
Markov model, hidden, and dynamic time warping for speech recognition; a unified view, **63** (1984) 1213–1243
Markov models, hidden, used for speaker-independent recognition of isolated words from a medium-size vocabulary, **63** (1984) 627–642
Martin, R. L., **63** (1984) 1571–1572
Martin, T., **63** (1984) 479–498
M-ary QAM signals, cross-polarized, over nondispersive fading channels, performance of, **63** (1984) 499–521
McRoy, S. A., **63** (1984) 2417–2437
Measurements and calculations, comparisons for wideband operation of nonlinear solid-state power amplifiers, **63** (1984) 231–248
Measuring the impulse response of a system using a crosscorrelation method, distortion analysis on, **63** (1984) 2171–2192
Medium-size vocabulary, use of hidden Markov models for speaker-independent recognition of isolated words from, **63** (1984) 627–642
Mee, C., III, **63** (1984) 1859–1876
Memory, write-once, coding for, **63** (1984) 1089–1112

Metal oxide semiconductor field-effect transistor *See* MOSFET
Methods in Traffic Calculations, **63** (1984) 1283–1310
M/G/1 queue with round-robin service discipline, approximate analysis of sojourn times in, **63** (1984) 1521–1535
Microwave radio transmission, **63** (1984) 2215–2259
Miller, G. L., **63** (1984) 1751–1767
Miller, J. H., **63** (1984) 2417–2437
Milner, J. M., **63** (1984) 1751–1767
Minicomputer-based operations systems, system sparing for, **63** (1984) 1029–1047
Minkoff, J. B., **63** (1984) 231–248
Mitchell, W. J., **63** (1984) 879–900
Mixture of data traffic types, queueing and framing disciplines for, **63** (1984) 1061–1087
Mixtures of exponential distributions, approximations for queues, **63** (1984) 163–175
Mobile radio systems, application of postfiltering in, **63** (1984) 1465–1475
Mobile radio systems, digital, using base station diversity, BER degradations caused by switching in, **63** (1984) 545–564
Model for the performance of word recognizers, probabilistic, **63** (1984) 1–32
Models for soliton propagation in materials, electrical transmission lines as; elementary aspects of video solitons, **63** (1984) 901–919
Models, open and closed, for networks of queues, **63** (1984) 1911–1979
Modular equipment designed for *SLC*® 96 subscriber loop carrier system, **63** (1984) 2333–2362
Modulation, click, **63** (1984) 401–423
*Moment Calculations by Digital Filters*, **63** (1984) 217–229
Monma, C. L., **63** (1984) 643–664
Morgan, S. P., **63** (1984) 1061–1087
Morgen, D. H., **63** (1984) 2362–2387
Morris, R. H., **63** (1984) 1649–1672
MOSFETS, short-channel, velocity-saturated characteristics of, **63** (1984) 1325–1404
Muehlner, D. J., **63** (1984) 337–355
Multichannel TDMA clocking system, **63** (1984) 89–114
Multiframe offices, computing capacity for interframe connections for, **63** (1984) 643–664
Multiobjective assignment problems, nonlinear zero-one combinatorial, goal-programming model and constructive algorithm for solving, **63** (1984) 665–677
Multipath propagation for 16-QAM, 90-Mb/s digital radio, adaptive transversal equalization of, **63** (1984) 1447–1463
Multiplexed graphics terminal, Blit, designed for the *UNIX*™ system, **63** (1984) 1607–1631
Multiprocessor *UNIX*™ operating systems, **63** (1984) 1733–1749
Murray, R. R., **63** (1984) 921–954

## N

Nelson, T. J., **63** (1984) 337–355
Netravali, A. N., **63** (1984) 1499–1520
Network of computers running the *UNIX*™ system, **63** (1984) 1877–1896
Network services circuits design, generic approaches to, **63** (1984) 737–773
Network, TDMA, with voice and data traffic, analysis of, **63** (1984) 1537–1563
Networks
  engineered, with nonhierarchical and hierarchical routing, overload performance of, **63** (1984) 1261–1281
  hierarchical, trunk implementation plan for, **63** (1984) 57–88
Networks of queues, open and closed models for, **63** (1984) 1911–1979
*New Beginning, A*, **63** (1984) iii
*1980 Bell System Noise Survey of the Loop Plant*, **63** (1984) 775–818
*1982/83 End Office Connection Study:*
  *Analog Voice and Voiceband Data Transmission Performance Characterization of the Public Switched Network*, **63** (1984) 2059–2119
  *ASPEN Data Acquisition System and Sampling Plan*, **63** (1984) 2033–2057
90-Mb/s, 16-QAM digital radio, adaptive transversal equalization of multipath propagation for, **63** (1984) 1447–1463
Noise, inductive, of chip packages, computing, **63** (1984) 177–195
Noise survey of the loop plant, 1980 Bell System, **63** (1984) 775–818
Nondispersive fading channels, performance of cross-polarized M-ary QAM signals over, **63** (1984) 499–521
Nonhierarchical and hierarchical routing, overload performance of engineered networks with, **63** (1984) 1261–1281
Nonlinear solid-state power amplifiers,

wideband operation; comparisons of calculations and measurements, **63** (1984) 231–248
*Nonlinear Zero-One Combinatorial, Goal-Programming Model and Constructive Algorithm for Solving Multiobjective Assignment Problems, A,* **63** (1984) 665–677
Norris, A. W., **63** (1984) 921–954

## O

*Off-Line Quality Control in Integrated Circuit Fabrication Using Experimental Design,* comments on and reply, **63** (1984) 1405–1409
Oh, Y. H., **63** (1984) 441–457
Olson, J. W., **63** (1984) 2283–2331, 2363–2387
*Open and Closed Models for Networks of Queues,* **63** (1984) 1911–1979
Operating system security, *UNIX™,* **63** (1984) 1649–1672
Operation and maintenance, *SLC®* 96 subscriber loop carrier system, **63** (1984) 2363–2387
Operations systems, minicomputer-based, system sparing for, **63** (1984) 1029–1047
Optical couplers, single GRIN-lens, **63** (1984) 431–439
Optical fibers, **63** (1984) 425–430
  polarization quality of, **63** (1984) 365–371
  silica, overtone absorption and Raman spectra of $H_2$ and $D_2$ in, **63** (1984) 991–1000
Optical transmission capability of the *SLC®* 96 subscriber loop carrier system, **63** (1984) 2389–2416
Optical waveguide devices, coated, exact calculation of reflection coefficient for, **63** (1984) 857–877
Optimization algorithms for integrated circuit fabrication, **63** (1984) 1191–1212
*Optimum Scan-Width Selection Under Containment Constraints,* **63** (1984) 1191–1212
*Overload Performance of Engineered Networks With Nonhierarchical and Hierarchical Routing, The,* **63** (1984) 1261–1281
*Overtone Absorption and Raman Spectra of $H_2$ and $D_2$ in Silica Optical Fibers,* **63** (1984) 991–1000
Overviews
  hardware and software for AT&T Technologies implementation of local area data transport, **63** (1984) 1135–1190
  local area data transport service, **63** (1984) 1113–1134
  *SLC®* 96 subscriber loop carrier system, **63** (1984) 2273–2281
Ozarow, L. H., **63** (1984) 2135–2157

## P

*Packet/Circuit Switch, A,* **63** (1984) 1499–1520
Packet data communication service, LADT
  overview, **63** (1984) 1113–1134
  overview of hardware and software for, **63** (1984) 1135–1190
Packet networks, application of postfiltering in, **63** (1984) 1465–1475
Packet speech transmission, **63** (1984) 33–55
Packet-switched local area network, Fusnet, **63** (1984) 307–336
Pan, K. C., **63** (1984) 1245–1260
Park, K. I., **63** (1984) 2059–2119
Parker, J. W., **63** (1984) 1447–1463
Paule, W. J., **63** (1984) 1135–1190
PCM, companded, over Gaussian and Rayleigh fading channels, transmission errors in, **63** (1984) 955–990
PCM, companded, transmitted over Rayleigh fading and Gaussian channels, weighting strategies for, **63** (1984) 587–626
PCM, logarithmic, transmitted over Rayleigh fading channels, soft decision demodulation to reduce the effect of transmission errors in, **63** (1984) 2193–2213
Pellegrin, J. F., **63** (1984) 1049–1059
Performance characterization, analog voice and voiceband data transmission, of the public switched network, 1982/83 end office connection study, **63** (1984) 2059–2119
*Performance of Cross-Polarized M-ary QAM Signals Over Nondispersive Fading Channels,* **63** (1984) 499–521
Performance of faster binary signaling with QAM, contrasting, **63** (1984) 1419–1445
*Performance of Isolated Word Speech Recognizers Using Vector Quantization and Temporal Energy Contours, On the,* **63** (1984) 1245–1260
Performance of word recognizers, probabilistic model for, **63** (1984) 1–32
Performance, overload, of engineered networks with nonhierarchical and hierarchical routing, **63** (1984) 1261–1281

Performance, user, and computer response time during data entry, **63** (1984) 1007–1018
Peterson, G. E., **63** (1984) 901–919
Phadke, M. S., **63** (1984) 1408–1409
Physical design, *SLC*® 96 subscriber loop carrier system, **63** (1984) 2333–2362
Pike, R., **63** (1984) 1595–1605, 1607–1631
Pinter, R. Y., **63** (1984) 1191–1212
*Polarization Quality of High-Birefringence Single-Mode Fibers*, **63** (1984) 365–371
Polarized fading radio channels, dually, linear equalization theory in digital data transmission over, **63** (1984) 2215–2259
Portability of *UNIX*™ operating system, **63** (1984) 1769–1790
Portable-radio communication systems, 800-MHz attenuation measurements, for, **63** (1984) 921–954
Porting experiences, *UNIX*™ operating system, **63** (1984) 1769–1790
Postfiltering, adaptive, enhancement of ADPCM speech by, **63** (1984) 1465–1475
Power amplifiers, nonlinear solid-state, wideband operation; comparison of calculations and measurements, **63** (1984) 231–248
Practice and theory in the construction of a working sort routine in the *UNIX*™ system, **63** (1984) 1827–1843
Predivestiture Bell System public switched telecommunications network, 1982/83 end office connections study, **63** (1984) 2033–2057, 2059–2119
Preface, the *UNIX*™ system, **63** (1984) 1571–1572
*Probabilistic Analysis of Interframe Tie Requirements for Cross-Connect Systems*, **63** (1984) 643–664
*Probabilistic Model for the Performance of Word Recognizers, A*, **63** (1984) 1–32
Probabilistic models in speech recognition applications, effectiveness of, **63** (1984) 1213–1243
Probability, blocking, in a switching center with arbitrary routing policy, **63** (1984) 709–720
*Processing Channel-Bank Spectrometer Data*, **63** (1984) 565–585
Processor network based on the *UNIX*™ system, **63** (1984) 1877–1896
Program design in the *UNIX*™ environment, **63** (1984) 1595–1605
Programmable bitmap graphics terminal designed for the *UNIX*™ system, Blit, **63** (1984) 1607–1631
Programming language C
  data abstraction in, **63** (1984) 1701–1732
  past and future, in the *UNIX*™ system, **63** (1984) 1685–1699
*Program Transformations for Data Access in a Local Distributed Environment*, **63** (1984) 1019–1028
Propagation, multipath, for 16-QAM, 90-Mb/s digital radio, adaptive transversal equalization of, **63** (1984) 1447–1463
Propagation, soliton, in materials, electrical transmission lines as models for; elementary aspects of video solitons, **63** (1984) 901–919
Protocol implementations using *UNIX*™ operating system virtual protocol machine, **63** (1984) 1859–1876
Public switched network
  transmission performance characterization, analog voice and voiceband, 1982/83 end office connection study, **63** (1984) 2059–2119
  transmission performance, 1982/83 end office connection study of, **63** (1984) 2033–2057
Pulse code modulation *See* PCM
Pyramidal horn-reflector antenna, experimental investigation of wide-angle sidelobe suppression in, **63** (1984) 531–544

# Q

QAM, contrasting performance of faster binary signaling with, **63** (1984) 1419–1445
QAM signals, cross-polarized M-ary, over nondispersive fading channels, performance of, **63** (1984) 499–521
Quadrature amplitude modulation *See* QAM
Quantizer, vector, combining energy and LPC parameters and its application to isolated word recognition, **63** (1984) 721–735
*Quarter-Wave Corrugated Transformer for Broadband Matching of a Corrugated Feed*, **63** (1984) 207–215
Queue, M/G/1, with round-robin service discipline, approximate analysis of sojourn times in, **63** (1984) 1521–1535
Queues
  extremal distributions for, **63** (1984) 115–138
  mixtures of exponential distributions for, **63** (1984) 163–175

networks of, open and closed models for, **63** (1984) 1911–1979
shape constraints for, **63** (1984) 139–161
*Queueing and Framing Disciplines for a Mixture of Data Traffic Types*, **63** (1984) 1061–1087
Queueing approximations
extremal distributions, **63** (1984) 115–138
mixtures of exponential distributions, **63** (1984) 163–175
shape constraints, **63** (1984) 139–161
Queueing networks, open and closed models for, **63** (1984) 1911–1979
Quigley, P. D., **63** (1984) 1447–1463

## R

Rabiner, L. R., **63** (1984) 459–477, 479–498, 627–642, 721–735, 1245–1260, 1981–1995
Radio astronomical measurements of radio brightness, one-dimensional case, **63** (1984) 1997–2031
Radio channels
dually polarized fading, linear equalization theory in digital data transmission over, **63** (1984) 2215–2259
nondispersive, performance of cross-polarized M-ary QAM signals over, **63** (1984) 499–521
Radio systems, digital mobile, using base station diversity, BER degradations caused by switching in, **63** (1984) 545–564
Radio-wave attenuation in and around suburban houses, **63** (1984) 921–954
Rainal, A. J., **63** (1984) 177–195
Raleigh, T. M., **63** (1984) 1877–1896
Ramamoorthy, V., **63** (1984) 1465–1475
Raman spectra and overtone absorption of $H_2$ and $D_2$ in silica optical fibers, **63** (1984) 991–1000
Rana, V. V. S., **63** (1984) 337–355
Ransom, M. N., **63** (1984) 1113–1134
Rao, T. N., **63** (1984) 2389–2416
Rayleigh and Gaussian fading channels, transmission errors in companded PCM over, **63** (1984) 955–990
Rayleigh fading and Gaussian channels, weighting strategies for companded PCM transmitted over, **63** (1984) 587–626
Rayleigh fading channels, soft decision demodulation to reduce the effect of transmission errors in logarithmic PCM transmitted over, **63** (1984) 2193–2213
Recognition of connected word sequences, application of energy contours to, **63** (1984) 1981–1995
Recovery of clipped signals
Fourier transform theory for, **63** (1984) 287–306
localization of infinite products, **63** (1984) 261–285
Redman, T. C., **63** (1984) 2033–2057
Reeds, J. A., **63** (1984) 1673–1683
Reflection coefficient for coated optical waveguide devices, exact calculation of, **63** (1984) 857–877
Remote terminal structure for *SLC*® 96 subscriber loop carrier system, **63** (1984) 2333–2362
Reply to Letter by D. B. Jugle, **63** (1984) 1408–1409
Requirements, interframe tie, for cross-connect systems, probabilistic analysis of, **63** (1984) 643–664
Response time, computer, and user performance during data entry, **63** (1984) 1007–1018
Retrieval, director listing, application of embedded training to connected letter recognition for, **63** (1984) 459–477
Ritchie, D. M., **63** (1984) 1577–1593, 1897–1910
Ritchie, D. M. and Thompson, K., inventors of the *UNIX*™ system, **63** (1984) 1571–1572, 1573–1576
Rod-lens directional couplers, GRIN, **63** (1984) 431–439
Roman, B. J., **63** (1984) 337–355
Ronkin, G., **63** (1984) 1769–1790
Rosenberg, A. E., **63** (1984) 1–32
Rosler, L., **63** (1984) 1685–1699
Round-robin service discipline, approximate analysis of sojourn times in the M/G/1 queue with, **63** (1984) 1521–1535
Routing, nonhierarchical and hierarchical, overload performance of engineered networks with, **63** (1984) 1261–1281
Routing policy, arbitrary, blocking probability in a switching center with, **63** (1984) 709–720
Rowe, H. E., **63** (1984) 565–585, 1997–2031

## S

Salz, J., **63** (1984) 2215–2259
Sampling plan and ASPEN data acquisition system, 1982/83 end office connection study, **63** (1984) 2033–2057
Satellite and terrestrial radio systems, nonlinear power amplifiers for, **63** (1984) 231–248

Saul, R. H., **63** (1984) 2389–2416
Scan-width selection, optimum, under containment constraints, **63** (1984) 1191–1212
Schan, E. P., **63** (1984) 1769–1790
Scheduler, fair share, in the *UNIX*™ operating system, **63** (1984) 1845–1857
Schepis, A. J., **63** (1984) 2273–2281
Schwartz, M. A., **63** (1984) 2363–2387
Sears, F. M., **63** (1984) 365–371
Security, file, and the *UNIX*™ system crypt command, **63** (1984) 1673–1683
Security, *UNIX*™ operating system, **63** (1984) 1649–1672
Selection of optimum scan-width containment constraints, **63** (1984) 1191–1212
Semantic and syntactic constraints in an improved word-detection algorithm for telephone-quality speech, **63** (1984) 479–498
Semiconductor injection lasers, use of single-lens antireflection coating films in, **63** (1984) 357–364
Service systems with blocking, heavy-traffic approximations for, **63** (1984) 689–708
Services circuits design, network, generic approaches to, **63** (1984) 737–773
Shape constraints, approximations for queues, **63** (1984) 139–161
Shepard, S. R., **63** (1984) 1447–1463
Short-channel MOSFETs, velocity-saturated characteristics of, **63** (1984) 1325–1404
Sidelobe suppression, wide-angle, in a pyramidal horn-reflector antenna, experimental investigation of, **63** (1984) 531–544
Signal clipping
  Fourier transform theory of recovery, **63** (1984) 287–306
  generalizations, **63** (1984) 379–399
  localization of infinite products, **63** (1984) 261–285
*Signals Designed for Recovery After Clipping*
  *I. Localization of Infinite Products*, **63** (1984) 261–285
  *II. Fourier Transform Theory of Recovery*, **63** (1984) 287–306
  *III. Generalizations*, **63** (1984) 379–399
Silica optical fibers, overtone absorption and Raman spectra of $H_2$ and $D_2$ in, **63** (1984) 991–1000
Siller, C. A., Jr., **63** (1984) 531–544, 1447–1463
Simpson, J. R., **63** (1984) 365–371
*Simulation-Based Comparison of Voice Transmission of CSMA/CD Networks and on Token Buses, A*, **63** (1984) 33–55
Sincoskie, W. D., **63** (1984) 1019–1028
*Single-GRIN-Lens Directional Couplers*, **63** (1984) 431–439
Single-layer antireflection coatings on laser facets, theoretical design of, **63** (1984) 357–364
Single-mode fibers, depressed cladding, design diagrams for, **63** (1984) 425–430
Single-mode high-birefringence fibers, polarization quality of, **63** (1984) 365–371
16-$\mu m^2$ cell in experimental ion-implanted bubble memory device, **63** (1984) 337–355
16-QAM, 90-Mb/s digital radio, adaptive transversal equalization of multipath propagation for, **63** (1984) 1447–1463
Slab waveguide, coated, exact calculation of reflection coefficient for, **63** (1984) 857–877
*SLC*® 96 Subscriber Loop Carrier System, The:
  *Acronyms and Abbreviations*, **63** (1984) 2439–2441
  *Channel Bank*, **63** (1984) 2283–2331
  *Fiber SLC Carrier System, The*, **63** (1984) 2389–2416
  *Integration With the 5ESS Switching System*, **63** (1984) 2417–2437
  *Maintenance and Operation*, **63** (1984) 2363–2387
  *Overview*, **63** (1984) 2273–2281
  *Physical Design*, **63** (1984) 2333–2362
Small businesses and homes, data transmission services provided by LADT to, **63** (1984) 1113–1134
Smith, D. R., **63** (1984) 643–664
*Soft Decision Demodulation to Reduce the Effect of Transmission Errors in Logarithmic PCM Transmitted Over Rayleigh Fading Channels*, **63** (1984) 2193–2213
Software and hardware overview of AT&T Technologies implementation of local area data transport, **63** (1984) 1135–1190
Software construction tool, build, **63** (1984) 1049–1059
Software design for interconnecting processors based on *UNIX*™ operating systems, **63** (1984) 1877–1896
Sojourn times in the M/G/1 queue with round-robin service discipline, approximate analysis of, **63** (1984)

1521–1535
Solid-state power amplifiers, nonlinear, wideband operation; comparison of calculations and measurements, **63** (1984) 231–248
Solution propagation in materials, electrical transmission lines as models for; elementary aspects of video solitons, **63** (1984) 901–919
Solving multiobjective assignment problems, nonlinear zero-one combinatorial, goal-programming model and constructive algorithm for, **63** (1984) 665–677
Sondhi, M. M., **63** (1984) 627–642, 721–735
Soong, F. K., **63** (1984) 1245–1260
Sort routine, working, in the *UNIX*™ system, theory and practice in the construction of, **63** (1984) 1827–1843
*Spatial Filtering Radio Astronomical Data: One-Dimensional Case*, **63** (1984) 1997–2031
Speaker-independent recognition of isolated words from a medium-size vocabulary, use of hidden Markov models for, **63** (1984) 627–642
Spectra, Raman, and overtone absorption of $H_2$ and $D_2$ in silica optical fibers, **63** (1984) 991–1000
Spectrometer data processing, channelbank, **63** (1984) 565–585
Speech coder performance evaluation, using the Itakura-Saito measures for, **63** (1984) 1477–1498
Speech processing, **63** (1984) 1465–1475
Speech recognition, **63** (1984) 1–32
  application of a vector quantizer combining energy and LPC parameters to, **63** (1984) 721–735
  LPC-based dynamic time-warping processor (DTWP) for, **63** (1984) 441–457
  unified view of hidden Markov model and dynamic time warping for, **63** (1984) 1213–1243
  use of hidden Markov models for, **63** (1984) 627–642
Speech recognizers, isolated word, using vector quantization and temporal energy contours, performance of, **63** (1984) 1245–1260
Speeney, D. V., **63** (1984) 1408–1409
State-of-the-art forecasting techniques, accuracy for telephone-usage-demand forecasts, **63** (1984) 819–849
*Stationary and Cyclostationary Finite Buffer Behaviour Computation via Levinson's Method*, **63** (1984) 2159–2170
Steele, R., **63** (1984) 587–626, 955–990, 2193–2213
Stelte, D. J., **63** (1984) 1135–1190
Sticky storage devices, capacity of, **63** (1984) 1311–1323
Stiefel, K. E., **63** (1984) 2283–2331
Stone, J., **63** (1984) 991–1000
Storage devices, sticky, capacity of, **63** (1984) 1311–1323
Strategies, weighting, for companded PCM transmitted over Rayleigh fading and Gaussian channels, **63** (1984) 587–626
Stream input-output system for *UNIX*™, **63** (1984) 1897–1910
Stroustrup, B., **63** (1984) 1701–1732
Subscriber loop carrier system *SLC*® 96
  *acronyms and abbreviations*, **63** (1984) 2439–2441
  channel bank, **63** (1984) 2283–2331
  fiber *SLC* carrier system, **63** (1984) 2389–2416
  integration with the *5ESS*™ switching system, **63** (1984) 2417–2437
  maintenance and operation, **63** (1984) 2363–2387
  overview, **63** (1984) 2272–2281
  physical design, **63** (1984) 2333–2362
Suburban houses, 800-MHz attenuation measured in and around, **63** (1984) 921–954
Sundberg, C.-E., **63** (1984) 587–626, 955–990, 2193–2213
Suppression of wide-angle radiation from pyramidal horn-reflector antennas, **63** (1984) 531–544
Switching center with arbitrary routing policy, blocking probability in, **63** (1984) 709–720
Switching in digital mobile radio systems using base station diversity, BER degradations caused by, **63** (1984) 545–564
Switching system, *5ESS*™, integrated with *SLC*® 96 subscriber loop carrier system, **63** (1984) 2417–2437
Switch, packet/circuit, **63** (1984) 1499–1520
Syntactic and semantic constraints in an improved word-detection algorithm for telephone-quality speech, **63** (1984) 479–498
System performance, *UNIX*™, evolution of, **63** (1984) 1791–1814
System security, *UNIX*™ operating, **63** (1984) 1649–1672
*System Sparing for Minicomputer-Based Operations Systems*, **63** (1984) 1029–1047

System/370 computers, IBM, implementation of *UNIX*™ operating system, for, **63** (1984) 1751–1767
System using a crosscorrelation method, distortion analysis on measuring the impulse response of, **63** (1984) 2171–2192
Systems integration, *SLC*® 96 subscriber loop carrier system, **63** (1984) 2417–2437

## T

Taguchi, G., **63** (1984) 1408–1409
Taylor, G. W., **63** (1984) 1325–1404
TDMA blocking system, demand assignment, analysis of, **63** (1984) 89–114
TDMA network with voice and data traffic, analysis of, **63** (1984) 1537–1563
Telecommunications network, predivestiture Bell System public switched, 1982/83 end office connection study, **63** (1984) 2033–2057, 2059–2119
Telephone-quality speech, improved word-detection algorithm incorporating both semantic and syntactic constraints for, **63** (1984) 479–498
Telephone usage demand forecasting, accuracy of, **63** (1984) 819–849
Temporal energy contours and vector quantization, performance of isolated word speech recognizers using, **63** (1984) 1245–1260
Terrace, S. G., **63** (1984) 459–477
Terrestrial satellite radio systems, nonlinear power amplifiers for, **63** (1984) 231–248
*Theoretical Design of Single-Layer Antireflection Coatings on Laser Facets*, **63** (1984) 357–364
Theory and practice in the construction of a working sort routine in the *UNIX*™ system, **63** (1984) 1827–1843
Thompson, K. and Ritchie, D. M., inventors of the *UNIX*™ system, **63** (1984) 1571–1572, 1573–1576
Thorkildsen, R., **63** (1984) 441–457
Tie requirements, interframe, for cross-connect systems, probabilistic analysis of, **63** (1984) 643–664
Time division multiple access *See* TDMA
Time-sharing system, *UNIX*™, evolution of, **63** (1984) 1577–1593
Time warping, dynamic, and hidden Markov model for speech recognition; a unified view, **63** (1984) 1213–1243
TIP *See* Trunk implementation plan
Token buses and CSMA/CD networks, simulation-based comparison of voice transmission on, **63** (1984) 33–55
Tolleth, D. W., **63** (1984) 1029–1047
Traffic calculations, methods in, **63** (1984) 1283–1310
Traffic types, data, queueing and framing disciplines for a mixture of, **63** (1984) 1061–1087
Traffic, voice and data, analysis of a TDMA network with, **63** (1984) 1537–1563
Transformations, program, for data access in a local distributed environment, **63** (1984) 1019–1028
Transformer, quarter-wave corrugated, for broadband matching of a corrugated feed, **63** (1984) 207–215
*Transmission Errors in Companded PCM Over Gaussian and Rayleigh Fading Channels*, **63** (1984) 955–990
Transmission errors in logarithmic PCM transmitted over Rayleigh fading channels, soft decision demodulation to reduce the effect of, **63** (1984) 2193–2213
Transmission lines, electrical, as models for soliton propagation in materials; elementary aspects of video solitons, **63** (1984) 901–919
Transmission performance characterization of the public switched network, analog voice and voiceband, 1982/83 end office connection study, **63** (1984) 2059–2119
Transmission performance of the public switched network, 1982/83 end office connection study of, **63** (1984) 2033–2057
Transmultiplexers, LT-1 connector family of, **63** (1984) 879–900
Transversal equalization, adaptive, of multipath propagation for 16-QAM, 90-Mb/s digital radio, **63** (1984) 1447–1463
Truesdale, J. B., **63** (1984) 2417–2437
Trunk forecasting, **63** (1984) 57–88
*Trunk Implementation Plan for Hierarchical Networks*, **63** (1984) 57–88
Trunk reservation applied to nonhierarchical and hierarchical networks, **63** (1984) 1261–1281

## U

UNIVAC® 1100 series processors, porting

® Trademark of Sperry Corporation.

the *UNIX*™ operating system, to, **63** (1984) 1769–1790
*UNIX*™ environment, program design in, **63** (1984) 1595–1605
*UNIX*™ operating system porting experiences, **63** (1984) 1769–1790
*UNIX*™ operating system security, **63** (1984) 1649–1672
*UNIX*™ operating systems, multiprocessor, **63** (1984) 1733–1749
*UNIX*™ sort routine, working, theory and practice in the construction of, **63** (1984) 1827–1843
*UNIX*™ stream input-output system, **63** (1984) 1897–1910
*UNIX*™ system crypt command and file security, **63** (1984) 1673–1683
*UNIX*™ system performance, evolution of, **63** (1984) 1791–1814
*UNIX*™ system performance on large mainframes, **63** (1984) 1751–1767
*UNIX*™ system programming language C, data abstraction in, **63** (1984) 1701–1732
*UNIX*™ system programming language C, evolution of, **63** (1984) 1685–1699
UNIX *System, The:*
*Blit: A Multiplexed Graphics Terminal, The,* **63** (1984) 1607–1631
*Cheap Dynamic Instruction Counting,* **63** (1984) 1815–1826
*Data Abstraction in C,* **63** (1984) 1701–1732
*Debugging C Programs With the Blit,* **63** (1984) 1633–1647
*Evolution of C—Past and Future, The,* **63** (1984) 1685–1699
*Evolution of the* UNIX *Time-sharing System, The,* **63** (1984) 1577–1593
*Evolution of* UNIX *System Performance, The,* **63** (1984) 1791–1814
*Fair Share Scheduler, The,* **63** (1984) 1845–1857
*File Security and the* UNIX *System Crypt Command,* **63** (1984) 1673–1683
*Foreword,* **63** (1984) 1573–1576
*Multiprocessor* UNIX *Operating Systems,* **63** (1984) 1733–1749
*Network of Computers Running the* UNIX *System, A,* **63** (1984) 1877–1896
*Preface,* **63** (1984) 1571–1572
*Program Design in the* UNIX *Environment,* **63** (1984) 1595–1605
*Stream Input-Output System, A,* **63** (1984) 1897–1910
*Theory and Practice in the Construction of a Working Sort Routine,* **63** (1984) 1827–1843
UNIX *Operating System Porting Experiences,* **63** (1984) 1769–1790
UNIX *Operating System Security,* **63** (1984) 1649–1672
UNIX *System Implementation for System/370, A,* **63** (1984) 1751–1767
*Virtual Protocol Machine, The,* **63** (1984) 1859–1876
*UNIX*™ time-sharing system, evolution of, **63** (1984) 1577–1593
*UNIX*™ user-level programs, portability of, **63** (1984) 1769–1790
*Use of Hidden Markov Models for Speaker-Independent Recognition of Isolated Words From a Medium-Size Vocabulary, On the,* **63** (1984) 627–642
User-level programs, *UNIX*™, portability of, **63** (1984) 1769–1790
User performance and computer response time during data entry, **63** (1984) 1007–1018

## V

Van Slooten, R. W., **63** (1984) 2417–2437
Varaiya, P., **63** (1984) 709–720
Variable-length coding for gray-level pictures, conditional, **63** (1984) 249–260
Varvaloucas, G. C., **63** (1984) 57–88
Vector quantization and temporal energy contours, performance of isolated word speech recognizers using, **63** (1984) 1245–1260
*Vector Quantizer Combining Energy and LPC Parameters and Its Application to Isolated Word Recognition, A,* **63** (1984) 721–735
Vella-Coleiro, G. P., **63** (1984) 337–355
*Velocity-Saturated Characteristics of Short-Channel MOSFETs,* **63** (1984) 1325–1404
Video solitons, elementary aspects of; electrical transmission lines as models for soliton propagation, **63** (1984) 901–919
Virtual protocol machine, *UNIX*™ operating system, **63** (1984) 1859–1876
Vlacich, E. J., **63** (1984) 2033–2057
Voice and data services on Fasnet, integrated, **63** (1984) 307–336
Voice and data traffic, analysis of a TDMA network with, **63** (1984) 1537–1563
Voice and voiceband, analog, data transmission performance characterization of the public switched network, 1982/83 end office connection study, **63** (1984) 2059–2119
Voiceband applications, generic approach to

design of network services circuits for, **63** (1984) 737–773
Voice transmission on CSMA/CD networks and on token buses, simulation-based comparison, **63** (1984) 33–55
VPM *See* Virtual protocol machine
VQ *See* Vector quantization

## W

Waveguide devices, coated optical, exact calculation of reflection coefficient for, **63** (1984) 857–877
*Weighting Strategies for Companded PCM Transmitted Over Rayleigh Fading and Gaussian Channels*, **63** (1984) 587–626
Weinberger, P. J., **63** (1984) 1673–1683, 1815–1826
Whitt, W., **63** (1984) 115–138, 139–161, 163–175, 689–708, 1911–1979
Wide-angle sidelobe suppression in a pyramidal horn-reflector antenna, experimental investigation of, **63** (1984) 531–544
*Wideband Operation on Nonlinear Solid-State Power Amplifiers—Comparisons of Calculations and Measurements*, **63** (1984) 231–248
Wiesenfeld, J. M., **63** (1984) 991–1000
Williams, J. D., **63** (1984) 737–773
Wilpon, J. G., **63** (1984) 459–477, 479–498
*Wire-Tap Channel II*, **63** (1984) 2135–2157
Witsenhausen, H. S., **63** (1984) 1311–1323
Wolf, J. K., **63** (1984) 1089–1112
WOM *See* Write-once memory
Wong, W. C., **63** (1984) 587–626, 955–990, 2193–2213
Word-detection algorithm for telephone-quality speech incorporating both syntactic and semantic constraints, improved, **63** (1984) 479–498
Word recognition, isolated
  LPC-based dynamic time-warping processor (DTWP) for, **63** (1984) 441–457
  vector quantizer combining energy and LPC parameters and its application to, **63** (1984) 721–735
Word recognition processor, **63** (1984) 441–457
Word recognizers, probabilistic model for the performance of, **63** (1984) 1–32
Word sequences, connected, application of energy contours to recognition of, **63** (1984) 1981–1995
Word speech recognizers, isolated, using vector quantization and temporal energy contours, performance of, **63** (1984) 1245–1260
Working sort routine in the *UNIX*™ system, theory and practice in the construction of, **63** (1984) 1827–1843
Write-once memory, coding for, **63** (1984) 1089–1112
Wyner, A. D., **63** (1984) 1089–1112, 2135–2157

## Y

Youssef, M. N., **63** (1984) 819–849

## Z

Zero-one combinatorial, goal-programming model, nonlinear, and constructive algorithm for solving multiobjective assignment problems, **63** (1984) 665–677
Ziv, J., **63** (1984) 1089–1112